

WHAT IS CLAIMED IS:

1. A camera module for mobile communication terminals,  
comprising:

5           an image capture device unit for focusing an image of a  
subject;

          a LED (light emitting diode) unit for emitting light to  
the subject;

          a FPC (flexible printed circuit) electrically connected  
10       between the image capture device unit and the LED unit; and

          a connector unit for applying an electric signal to the  
image capture device unit.

2. The module as set forth in claim 1, wherein the image  
15       capture device unit comprises:

          a housing having a space defined therein;

          a camera lens disposed to the upper part of the housing  
for focusing the image of the subject; and

          an image capture device PCB (printed circuit board)  
20       adapted for supporting the housing,

          wherein the PCB has an image sensor for capturing the  
image of the subject mounted to the middle upper surface  
thereof.

25           3. The module as set forth in claim 1, wherein the LED

unit comprises:

- a LED for emitting light to the subject; and
- a LED PCB formed so that the LED is mounted thereon.

5           4. The module as set forth in claim 3, wherein the LED  
is attached to the LED PCB upside down.

          5. The module as set forth in claim 1, wherein the LED  
unit is mounted on the housing of the image capture device  
10 unit.

          6. The module as set forth in claim 1, wherein the LED  
unit further comprises a retainer for guiding the light  
emitted from the LED.

15           7. The module as set forth in claim 1, wherein the image  
capture device unit and the LED unit are electrically connected  
to the FPC, respectively, via a flexible cable connector.

20           8. The module as set forth in claim 1, wherein the image  
capture device unit and the LED unit are electrically connected  
to the FPC, respectively, by soldering.

          9. The module as set forth in claim 1, wherein the image  
25 capture device unit and the LED unit are electrically connected

to the FPC, respectively, by means of anisotropic conductive film, anisotropic conductive paste, or adhesive resin.

10. A camera module for mobile communication terminals,  
5 comprising:

an image capture device unit for focusing an image of a subject;

a LED for emitting light to the subject;

a FPC including a first flexible part formed so that the  
10 image capture device unit is mounted thereon, a second flexible part formed so that the LED is mounted thereon, and a connection part for electrically connecting the first flexible part and the second flexible part, the first flexible part and the second flexible part being integrally formed with the  
15 connection part; and

a connector unit for applying an electric signal to the FPC.

11. The module as set forth in claim 10, wherein the  
20 image capture device unit comprises:

a housing having a space defined therein and supported by the first flexible part of the FPC;

a camera lens disposed to the upper part of the housing for focusing the image of the subject; and

25 an image sensor mounted on the first flexible part of the

FPC.

12. The module as set forth in claim 10, wherein the LED  
is attached to the second flexible part of the FPC upside  
5 down.

13. The module as set forth in claim 10, wherein the LED  
is mounted on the housing of the image capture device unit.

10 14. The module as set forth in claim 10, further  
comprising a retainer for guiding the light emitted from the  
LED.

15 15. A camera module for mobile communication terminals,  
comprising:

an image capture device unit for focusing an image of a  
subject;

a LED for emitting light to the subject;

20 a rigid-flexible PCB including a first rigid part formed  
so that the image capture device unit is mounted thereon, a  
second rigid part formed so that the LED is mounted thereon,  
and a flexible connection part for electrically connecting the  
first rigid part and the second rigid part; and

25 a connector unit for applying an electric signal to the  
rigid-flexible PCB.

16. The module as set forth in claim 15, wherein the image capture device unit comprises:

a housing having a space defined therein and supported by the first rigid part of the rigid-flexible PCB;

5 a camera lens disposed to the upper part of the housing for focusing the image of the subject; and

an image sensor mounted on the first rigid part of the rigid-flexible PCB.

10 17. The module as set forth in claim 15, wherein the LED is attached to the second rigid part of the rigid-flexible PCB upside down.

15 18. The module as set forth in claim 15, wherein the LED is mounted on the housing of the image capture device unit.

19. The module as set forth in claim 15, further comprising a retainer for guiding the light emitted from the LED.

20 20. A camera module for mobile communication terminals, comprising:

an image capture device PCB having an image sensor for capturing an image of a subject mounted to the upper surface thereof;

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at least one FPC connected to the image capture device PCB;

at least one part-mounting PCB electrically connected to the image capture device PCB via the FPC;

5 at least one mobile communication terminal part mounted on the part-mounting PCB; and

a connector unit for applying an electric signal to the image capture device PCB.

10 21. A camera module for mobile communication terminals, comprising:

an image sensor for focusing an image of a subject;

at least one mobile communication terminal part;

15 a FPC including a first flexible part formed so that the image sensor is mounted thereon, at least one second flexible part formed so that the mobile communication terminal part is mounted thereon, and at least one connection part for electrically connecting the first flexible part and the second flexible part; and

20 a connector unit for applying an electric signal to the FPC.

22. A camera module for mobile communication terminals, comprising:

25 an image sensor for focusing an image of a subject;

at least one mobile communication terminal part;

a rigid-flexible PCB including a first rigid part formed so that the image sensor is mounted thereon, at least one second rigid part formed so that the mobile communication terminal part is mounted thereon, and at least one flexible connection part for electrically connecting the first rigid part and the second rigid part; and

a connector unit for applying an electric signal to the rigid-flexible PCB.

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23. A camera module for mobile communication terminals, comprising:

a housing having a space defined therein;

a camera lens disposed to the upper part of the housing for focusing an image of a subject;

a PCB adapted for supporting the housing, the PCB having an image sensor for capturing the image of the subject mounted to the middle upper surface thereof;

at least one LED disposed on the PCB outside the housing for emitting light to the subject; and

a connector unit for applying an electric signal to the PCB.

24. The module as set forth in claim 23, further comprising an optical fiber provided around the LED for

forwardly guiding the light emitted from the LED.

25. The module as set forth in claim 23 or 24, further comprising an iris filter (IR filter) disposed in the space of  
5 the housing for controlling an amount of light of the image focused from the camera lens.

26. The module as set forth in claim 23 or 24, further comprising a lens holder,  
10 wherein the camera lens is attached to the housing via a lens holder.

27. The module as set forth in claim 23 or 24, wherein the LED is a SMD LED.  
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28. The module as set forth in claim 24,  
wherein the optical fiber is formed in the shape of a cylinder comprising a core part and a cladding part surrounding the core part, and  
20 wherein the optical fiber has an open end and a closed end, whereby the optical fiber is fitted around the LED through the open end.

29. The module as set forth in claim 28, wherein the  
25 optical fiber is coated with a flexible conduit tube for



preventing any bending or damage to the optical fiber due to external impact.

30. The module as set forth in claim 28, wherein the  
5 closed end of the optical fiber is concave.